

# MAT 161 Calculus 1

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Office Hours: Monday 1-3, Thursday 4-5, Friday 1-2 (no appointment necessary).  
Feel free to make an appointment if you cannot come to my regular office hours.

## Topics covered:

1. Limits, continuity
2. Infinite limits, limits at infinity, asymptotes
3. The derivative, rates of change
4. Finding and using derivative
5. Higher derivatives. Differentiability

(Exam 1)

6. Product, quotient and chain rules
7. Derivatives of exponential, logarithmic and trigonometric functions
8. Linear approximation
9. Implicit differentiation
10. Related rates

(Exam 2)

11. Increasing and decreasing functions
12. Second derivative and concavity
13. Relative extrema. First and second derivative tests
14. Graphical analysis
15. Absolute extrema and optimization

(Exam 3)

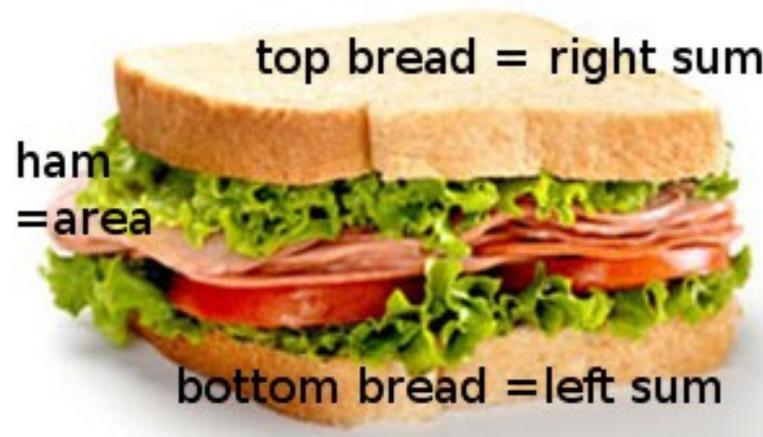
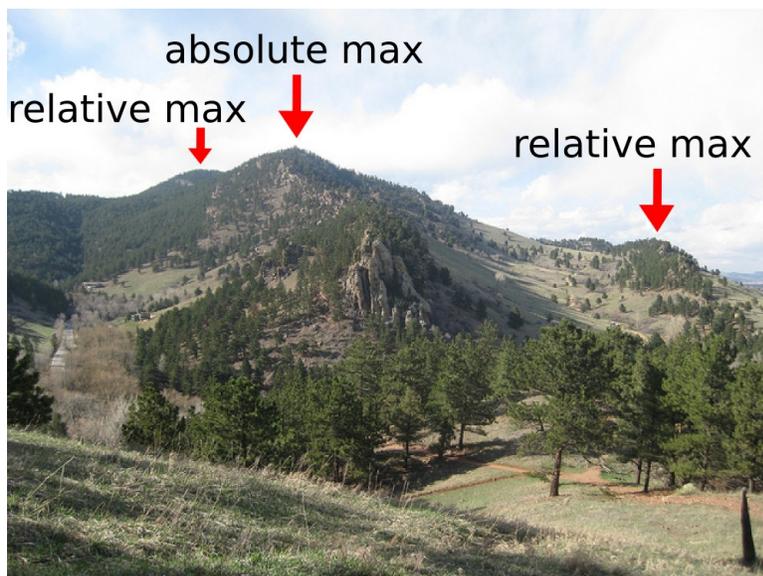
16. Indefinite integral. Substitution
17. Integrals of exponential and trigonometric functions. Integrals producing logarithms
18. Left and right sums. Definite integral
19. The Fundamental Theorem of Calculus
20. Areas between curves

(Final Exam)

**Text:** No textbook required.

Handouts with new material and practice problems will be distributed for each teaching unit.

The course topics match chapters 2 to 5 (without 2.4, 4.8, and 4.9), and sections 6.1, and 7.1



to 7.4 of *Calculus* by James Stewart, published by Brooks/Cole. The same book covers topics of Calculus 2 and 3 courses.

**Technology:** All students are required to have a graphing calculator. Instructions will be given for TI83(+) or TI-84 calculators.

**Tentative Exam Schedule:**

Exam 1. During week 4

Exam 2. During week 7

Exam 3. During week 11

Final Exam: During the finals week

**Grading:**

Exams 1, 2 and 3	18% each
Final Exam	24%
Homework Assignments	11%
Projects	11%
<b>TOTAL</b>	<b>100%</b>

Grades are computed according to the following system:

letter grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F
number grade	93 to 100	90 to 92	87 to 89	83 to 86	80 to 82	77 to 79	73 to 76	70 to 72	67 to 69	60 to 66	0 to 59

**Relevant Course Elements.**

**Number of credits:** 4

**Prerequisites:** MA120, placement or the permission of instructor.

**Attendance:** It is imperative that students attend all classes. Students are responsible for all material covered in class, even if attendance is not checked or assignments collected. This is a rigorous course. You should plan to spend a minimum of twice the number of class hours on reading, homework assignments, and practice problems. It is your responsibility to come to class prepared to ask questions on any covered concept.

**Exams:** There will be **3 semester exams and a cumulative final exam**. No makeup exam will be given unless the excuse for missing the scheduled exam is acceptable to the instructor. Any makeup exam must be taken **before** the next regularly scheduled exam. **No exam grade will be dropped.**

**Assignments and projects:** There will be **4 assignments and 3 projects** during the semester. There will be **no makeup** assignments or projects. Assignments and projects turned in after their due date will receive an automatic reduction in grade. **No assignment or project grade will be dropped.**

**Response time:** The assignments, projects and exams are typically graded in three days after they are turned in. Special circumstances like snow days, school closing or holidays, may occasionally delay the response time. Barring special circumstances, students' emails are usually responded to within one working day.

**Course Objectives.** By passing all exams and projects with at least 60% accuracy, the student will be able to:

- obtain a well rounded introduction to the area of limits, differentiation and basic integration techniques;
- develop basic knowledge of calculus problem formulation, problem solving and modeling techniques required for successful application of mathematics;
- competently use the appropriate technology to model data, implement mathematical algorithms and solve mathematical problems.
- cultivate the analytical skills required for the efficient use and understanding of mathematics.

**Learning outcomes:** Students will

- know the basic concepts of differential and integral calculus.
- demonstrate proficiency in differentiation and integration techniques.
- be able to interpret and critique graphs using calculus techniques.
- be able to understand and solve multidisciplinary application problems using calculus.
- demonstrate proficiency in using mathematical software.
- know how to use appropriate technology to solve problems applying calculus techniques.

**Academic Integrity Statement:** Saint Joseph's University encourages the free and open pursuit of knowledge; we consider this to be a fundamental principle and strength of a democratic people. To this end, SJU expects its students, its faculty, its administrators, and its staff to uphold the highest standards of academic integrity. The University expects all members of the University community to both honor and protect one another's individual and collective rights.

**Students with Disabilities Statement:** Reasonable academic accommodations may be provided to students who submit appropriate documentation of their disability. If students have need of assistance or questions with this issue, they are encouraged to contact the Office of Student Disability Services (SDS) at [sds@sju.edu](mailto:sds@sju.edu) or by phone at 610.660.1774. The Office of SDS also provides an appeal/grievance procedure for complaints regarding requested or offered reasonable accommodations. More information can be found at: [www.sju.edu/sds](http://www.sju.edu/sds).

**Health and Wellness Statement:** Saint Joseph's University recognizes that physical and mental health strongly impact one's ability to do well in school and in life. As a result, there are many helpful campus resources designed to help students to care for their physical, mental, and spiritual health. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, mental health, alcohol or other drugs, identities, finances, etc. All of us benefit from support during times of struggle and challenges. If you are experiencing concerns, seeking assistance sooner rather than later is a courageous thing to do for yourself and those who care about you. The resources at <https://sites.sju.edu/counseling/> can help you to cope with stress and to achieve your academic and personal goals.

**COVID-19:** SJU's Covid-19 policy is available at:

<https://www.sju.edu/hawk-hill-ahead/health-and-safety/monitoring>

In particular, it states that all faculty, staff, students and visitors are asked to carry a mask at all times while on campus and that they should wear it if asked to. Since my office is relatively small, please note that I ask you to wear a mask when you are in my office.